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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CURS, NATHAN M	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 10/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H·A

Office Action Summary	Application No.	Applicant(s)	
	10/041,682	BLAIR ET AL.	
	Examiner	**Art Unit**	
	Nathan Curs	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _07 January 2002_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-49_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-49_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _07 January 2002_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _5/03_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 38 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 38, the applicant discloses heterodyne reception where active path length stabilization is not needed (specification page 18, lines 7-14), but does not disclose heterodyne reception where active path length stabilization is used on one of the paths of the interferometer.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 15, 16, 31, 33, 41 and 43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 recites the limitation "the reference frequency". There is insufficient antecedent basis for this limitation in the claim.

Claims 16, 31 and 41 are rendered indefinite by reference to an object that is variable, specifically, the object n, " where 'n' is a number determined by a global system performance analysis".

Claims 33 and 43 recite the limitation " each channel". There is insufficient antecedent basis for these limitations in the claims.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 9, 18, and 20-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Hung (US Patent Application Publication No. 2004/0008989).

Regarding claim 1, Hung discloses a method of communicating a plurality of signals that have been coherently multiplexed together over an optical link from a first site, the method comprising the steps of: operating a light source unit to produce multiple mutually coherent outputs which are directed as optical signals into a plurality of optical paths comprising "N" signal paths and a reference path (fig. 7 and paragraph 0050) wherein each of the "N" signal paths form one of "N" signal arms of "N" interferometers, the reference path forms the reference path arm for each interferometer, and the path length difference of each interferometer is delta.L.sub.i (fig. 7, element 700 and elements D1-D4 and R); wherein each of the "N" signal paths have a modulator therein which receives optical signals and modulates the received

optical signals with data (fig. 7, element 705 and paragraph 0050); and, combining the optical signals from each of the "N" signal paths and from the reference path to generate a combined optical signal that is transmitted on a single optical path (fig. 7, element 707 and paragraph 0050).

Regarding claim 9, Hung discloses the method of Claim 1, wherein the light source unit produces a singular output which is imaged into multiple optical fibers (fig. 7, element 701 and subsequent splitter).

Regarding claim 18, Hung discloses the method of Claim 1, wherein the modulator uses phase modulation (paragraph 0050).

Regarding claim 20, Hung discloses a method of communicating a plurality of signals over an optical link from a first site, the method comprising the steps of: multiplexing at the first site "M" signals to produce a single multiplexed signal, wherein at least one of the "M" signals has been coherently multiplexed and, optically transmitting a multiplexed signal to a second site (fig. 10 and paragraphs 0047 and 0054).

Regarding claim 21, Hung discloses the method of Claim 20, wherein the step of multiplexing includes wavelength division multiplexing (fig. 10 and paragraph 0054).

Regarding claim 22, Hung discloses the method of Claim 20, further comprising the steps of demultiplexing at a second site the multiplexed signal into "M" signals, and directing at least one of the "M" signals to a coherent demultiplexing unit (fig. 10 and paragraph 0054).

Regarding claim 23, Hung discloses the method of Claim 22, wherein the step of demultiplexing includes wavelength division demultiplexing (fig. 10 and paragraph 0054).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 2, 13, 14, 29, 30, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US Patent Application Publication No. 2004/0008989).

Regarding claim 2, Hung discloses the method of Claim 1, further comprising the steps of optically splitting the combined signal into "N" optical signals on "N" path pairs at a second site, and coherently demultiplexing each of the "N" optical signals to retrieve the data through differential detection (fig. 7, elements 709, 711 and "phase delay reversal" and paragraph 0050). Hung discloses performing a phase delay reversal at the receive end, where each path pair receives the reference signal (fig. 7, element 709 and paragraph 0050), but does not explicitly show that each "N" path pair a forms an interferometer with two inputs and two outputs with the path length difference of each interferometer being delta.L.sub.i.prime. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to use an interferometer for each receive end path pair shown by Hung, with each path pair interferometer reflecting the inverse of the corresponding phase delay interferometer structure of the transmitter, in order to reverse the delay in each receive end path pair as disclosed by Hung.

Regarding claim 13, Hung discloses the method of Claim 1, wherein the light source unit comprises a single source that feeds a splitter, where one output of the splitter feeds a common reference path (r) for "N" interferometers and the other output of the coupler feeds "N" signal paths comprising the second arms of the "N" interferometers (fig. 7, element 703). Hung does not disclose the single source feeding a 1x2 coupler, with one output of the coupler feeding a

common reference path (r) for "N" interferometers and the other output of the coupler feeds a 1xN splitter; however, it would have been obvious to one of ordinary skill in the art at the time of the invention that the reference path could be formed by a 1x2 coupler and then the N paths formed by a 1xN splitter, as passive optical coupling using couplers and splitters is very well known in the art and there is no functional difference between using one coupler for splitting followed by a splitter versus simply using one splitter.

Regarding claim 14, Hung discloses the method of Claim 13, wherein "N" is greater than or equal to 3 (fig. 7, element 703).

Regarding claim 29, Hung discloses a method of receiving a plurality of optical signals that have been coherently multiplexed together and transmitted over an optical link from a first site to a second site, the method comprising the steps of receiving an optical signal; optically splitting the received signal into "N" optical signals on "N" path pairs and coherently demultiplexing the "N" optical signals (fig. 7, element 709 and paragraph 0050). Hung does not explicitly disclose the interferometers of the receive end as each of “N” path pairs forming an interferometer with two inputs and two outputs with the path length difference of each interferometer being delta.L.sub.i; however, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the reverse of the interferometer structure of the transmitter at the receive end as described above for claim 2.

Regarding claim 30, Hung discloses the method of Claim 29, wherein the step of coherently demultiplexing is performed using a coherent demultiplexer matched to a coherence multiplexer so that |delta.L.sub.i – delta.L.sub.i'| < L.sub.coh (fig. 7, element 709 and paragraphs 0049 and 0050).

Regarding claim 34, Hung discloses the method of Claim 29, wherein the step of coherent demultiplexing is performed using a coherence demultiplexer having a coherence

receiver therein (fig. 7 and paragraph 0050), and wherein an active polarization adjuster with feedback communicates with the coherence receiver (fig. 15, element 1503 and paragraph 0063).

Regarding claim 35, Hung discloses the method of Claim 29, wherein the step of coherent demultiplexing is performed using a coherence demultiplexer having an interferometer (fig. 7 and paragraph 0050), and wherein an active polarization adjuster with feedback is placed in one path of the interferometer (fig. 15, element 1503 and paragraph 0063, where element 1503, feedback controlled via the microcontroller, is in a path of the interferometer).

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US Patent Application Publication No. 2004/0008989) in view of Gluckstad (US Patent No. 6011874).

Regarding claim 3, Hung discloses the method of Claim 1, but does not discloses that the light source unit comprises a phase locked laser diode array. Gluckstad discloses that a phase locked laser diode array is one of several means for achieving coherent light radiation (col. 5, lines 16-22). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a phase locked laser diode array to achieve coherent light radiation for the light source unit of Hung, since Gluckstad discloses this as conventional.

10. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US Patent Application Publication No. 2004/0008989) in view of Gluckstad (US Patent No. 6011874) as applied to claim 3 above, and further in view of Leger et al. ("Leger") (US Patent No. 5027359).

Regarding claims 4, 5 and 6, the combination of Hung and Gluckstad discloses the method of Claim 3, but does not disclose that the light source unit includes an imaging system

comprising a microlens array and cylindrical lens. However, Leger discloses a phase locked laser diode array for producing coherent laser light, including an imaging system comprising a microlens array and cylindrical lens (fig. 3 and col. 1, lines 10-28 and col. 6, lines 26-61). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the phase locked laser diode array of Leger in the combination of Hung and Gluckstad, to achieve coherent light radiation capable of achieving high power and high brightness, as taught by Leger.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US Patent Application Publication No. 2004/0008989) in view of Gluckstad (US Patent No. 6011874), and further in view of Barlow (US Patent No. 4401363).

Regarding claim 7, Hung discloses the method of Claim 1, but does not disclose that the light source unit comprises a phase locked light emitting diode array. Gluckstad discloses that a phase locked laser diode array is one of several means for achieving coherent light radiation (col. 5, lines 16-22). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a phase locked laser diode array to achieve coherent light radiation for the light source unit of Hung, since Gluckstad discloses this as conventional. Further, Barlow discloses that either a laser diode or an LED can produce a coherent light output (col. 2, line 67 to col. 3, line 8). It would have been obvious to one of ordinary skill in the art at the time of the invention that either laser diodes or LEDs could be used for the light radiation means of the phase locked diode array of the combination of Hung and Gluckstad, since the coherent LED and coherent laser are essentially interchangeable as taught by Barlow.

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US Patent Application Publication No. 2004/0008989) in view of Gluckstad (US Patent No. 6011874), and further in view of Barlow (US Patent No. 4401363) as applied to claim 7 above, and further in view of Leger (US Patent No. 5027359).

Regarding claim 8, the combination of Hung and Gluckstad discloses the method of Claim 7, but does not disclose that the light source unit includes an imaging system. However, Leger discloses a phase locked laser diode array for producing coherent laser light, including an imaging system comprising a microlens array and cylindrical lens (fig. 3 and col. 1, lines 10-28 and col. 6, lines 26-61). It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the phase locked laser diode array teaching of Leger to the phase locked LED array in the combination of Hung and Gluckstad, to achieve coherent light radiation capable of achieving high power and high brightness, as taught by Leger.

13. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US Patent Application Publication No. 2004/0008989) in view of Leger (US Patent No. 5027359).

Regarding claims 10, 11 and 12, Hung discloses the method of Claim 1, wherein the light source unit produces a singular output which is transmitted into multiple integrated optical waveguide channels (fig. 7, element 701 and subsequent splitter), but does not disclose that the light source output is imaged by an imaging system comprising a microlens array and cylindrical lens. However, Leger discloses a phase locked laser diode array for producing coherent laser light, including an imaging system comprising a microlens array and cylindrical lens (fig. 3 and col. 1, lines 10-28 and col. 6, lines 26-61). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the phase locked laser diode array of Leger in Hung to

achieve coherent light radiation capable of achieving high power and high brightness, as taught by Leger.

14. Claims 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US Patent Application Publication No. 2004/0008989) in view of Kartalopoulos ("Introduction to DWDM Technology", IEEE Press, 2000; pages 161-167).

Regarding claims 17 and 19, Hung discloses the method of Claim 1, where the system is a coherence multiplexing system and wherein the modulator uses phase modulation, but does not disclose that the modulator uses amplitude or frequency modulation. Kartalopoulos discloses PSK, FSK and ASK optical modulation for optical coherence transmission using in-line modulation techniques (page 161 and pages 165-167, sections ASK, PSK and FSK). It would have been obvious to one of ordinary skill in the art at the time of the invention that the phase modulation for the data modulation of Hung could be substituted with amplitude or frequency modulation, since all three modulation techniques are conventional for optical data modulation and each have their own advantages and disadvantages, as taught by Kartalopoulos.

15. Claims 15, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US Patent Application Publication No. 2004/0008989) in view of Kartalopoulos ("Introduction to DWDM Technology", IEEE Press, 2000; pages 161-167), and further in view of Kowalski (US Patent Application Publication No. 2001/0048538).

Regarding claim 15, Hung discloses the method of Claim 1, and discloses the system as a coherence multiplexing system, but does not disclose that a frequency modulator is placed in the reference path to shift the reference frequency. Kartalopoulos discloses that optical heterodyne or homodyne detection techniques are used for coherent optical transmission

systems (page 161, second paragraph). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use optical heterodyne or homodyne detection techniques at the receivers in the coherence multiplexing system of Hung, since this is conventional for optical coherence transmission, as taught by Kartalopoulos. In addition, Kowalkski discloses an interferometer-based transmitter, where a frequency shifter is used in one branch in order to achieve heterodyne signal detection (paragraphs 0049 and 0059). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a frequency shifter on the reference signal arm of the Hung coherence multiplexer, to achieve heterodyne signal detection for each coherence signal, since heterodyne signal detection is conventional for optical coherence transmission.

Regarding claim 36, Hung discloses the method of Claim 29, wherein the step of coherent demultiplexing is performed using a coherence demultiplexer having an interferometer, as described above for claim 29, but does not disclose that a frequency modulator is placed in one path of the interferometer. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Kartalopoulos and Kowalski with Hung as described above for claim 15.

Regarding claim 37, Hung discloses the method of Claim 29, but does not disclose that the step of coherent demultiplexing is performed using a coherence demultiplexer using heterodyne reception. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Kartalopoulos and Kowalski with Hung as described above for claim 15.

16. Claims 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US Patent Application Publication No. 2004/0008989) in view of Islam et al. ("Islam") (US Patent Application Publication No. 2002/0131693).

Regarding claim 24, Hung discloses the method of Claim 20, but does not disclose the step of spectrally slicing the output of a broadband light source into "M" separate outputs having different wavelengths. Islam discloses generated source wavelengths for a WDM system by spectrally slicing a broadband light source (paragraph 0005). It would have been obvious to one of ordinary skill in the art at the time of the invention to generated source wavelengths for the WDM wavelengths of Hung by spectrally slicing a broadband light source, in order to avoid the high cost of wavelength stabilization for individual wavelength lasers, as taught by Islam (paragraph 0004).

Regarding claim 25, the combination of Hung and Islam discloses the method of Claim 24, wherein the broadband light source comprises a mode locked laser source (Islam: paragraph 0005).

Regarding claim 26, the combination of Hung and Islam discloses the method of Claim 24, wherein the broadband light source comprises a fiber amplifier (Islam: paragraph 0005).

Regarding claim 27, the combination of Hung and Islam discloses the method of Claim 24, wherein the broadband light source comprises an amplified spontaneous emission source (Islam: paragraph 0005).

Regarding claim 28, the combination of Hung and Islam discloses the method of Claim 24, wherein the step of spectrally slicing comprises wavelength division demultiplexing (Islam: paragraph 0005, where spectral slicing is the same as wavelength demultiplexing the broadband spectrum).

17. Claims 32, 39-42, 44, 45 and 47-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US Patent Application Publication No. 2004/0008989) in view of Kartalopoulos ("Introduction to DWDM Technology", IEEE Press, 2000; pages 161-167), and further in view of Mahon et al. ("Mahon") (US Patent No. 5477369).

Regarding claim 32, Hung discloses the method of Claim 29, but does not disclose that the step of coherently demultiplexing employs homodyne reception and active path length stabilization. Kartalopoulos discloses that optical heterodyne or homodyne detection techniques are used for coherent optical transmission systems (page 161, second paragraph). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use optical heterodyne or homodyne detection techniques at the receivers in the coherence multiplexing system of Hung, since this is conventional for optical coherence transmission, as taught by Kartalopoulos. Further, Mahon discloses a homodyne receiver for optical signal, where the path lengths of the receiver are adapted in conformity with a selected fixed phase difference (col. 2, line 42 to col. 3, line 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to use active path length stabilization for homodyne detection, based on the homodyne detection teaching of Mahon, in order to maximize amplitude of the signal beams for detection, as taught by Mahon.

Regarding claim 39, Hung discloses a method of communicating a plurality of signals over an optical link from a first site to a second site, the method comprising the steps of optically multiplexing the outputs of "M" signals to form a multiplexed signal, wherein at least one of the "M" signals has been coherently multiplexed; communicating the multiplexed signal to a second site; optically demultiplexing the multiplexed signal at the second site into "M" optically demultiplexed signals; delivering the "M" optically demultiplexed signals to at least one coherent demultiplexer (fig. 7, element 709 and paragraphs 0047 and 0050). Hung does not explicitly

disclose the interferometers of the receive end as each of "N" path pairs, where a single path pair forms an interferometer with two arms having different path lengths, wherein the two arms include a signal path carrying a data signal and a reference path carrying a reference signal; recombining the data signal and the reference signal to produce a recombined signal. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the reverse of the interferometer structure of the transmitter at the receive end as described above for claim 2. Hung does not disclose communicating the recombined signal to a coherence receiver having two light source detectors connected to a differential amplifier. Kartalopoulos discloses that optical heterodyne or homodyne detection techniques are used for coherent optical transmission systems (page 161, second paragraph). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use optical heterodyne or homodyne detection techniques at the receivers in the coherence multiplexing system of Hung, since this is conventional for optical coherence transmission, as taught by Kartalopoulos. Further, Mahon discloses a coherence receiver having two light source detectors connected to a differential amplifier (fig. 1 and col. 3, line 60 to col. 4, line 44). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the coherence receiver of Mahon for receiving the optical signals demultiplexed in Hung, since such detection for coherence signals is conventional in optical systems.

Regarding claim 40, the combination of Hung, Kartalopoulos and Mahon discloses the method of Claim 39, wherein each coherence demultiplexer is matched to a coherence multiplexer (Hung: paragraph 0049, where "matched" coherence means |delta.L.sub.i – delta.L.sub.i.prime| < L.sub.coh).

Regarding claim 41, the combination of Hung, Kartalopoulos and Mahon discloses the method of Claim 40, wherein the optical signals on the signal path and the reference path are

separated in path length from each other by a distance of at least n Loh (Hung: paragraph 0059).

Regarding claim 42, the combination of Hung, Kartalopoulos and Mahon discloses the method of Claim 39, wherein each coherence demultiplexer includes a coherence receiver using homodyne reception and active path length stabilization (Mohan: col. 2, line 42 to col. 3, line 3).

Regarding claim 44, the combination of Hung, Kartalopoulos and Mahon discloses the method of Claim 39, further comprising a step of adjusting the polarity of the reference signal with an active polarization adjuster using feedback (Hung: fig. 15, element 1503 and paragraph 0063).

Regarding claim 45, the combination of Hung, Kartalopoulos and Mahon discloses the method of Claim 39, wherein an active polarization adjuster with feedback exists in one path of each interferometer (Hung: fig. 15, element 1503 and paragraph 0063).

Regarding claim 47, the combination of Hung, Kartalopoulos and Mahon discloses the method of Claim 39, wherein the coherence receiver uses heterodyne reception, as described above for claim 39.

Regarding claim 48, the combination of Hung, Kartalopoulos and Mahon discloses the method of Claim 47, wherein active path length stabilization is used in one of the paths of the interferometer (Mohan: col. 2, line 42 to col. 3, line 3).

Regarding claim 49, the combination of Hung, Kartalopoulos and Mahon discloses the method of Claim 39, further comprising a step of dropping a channel having N coherence multiplexed signals (Hung: fig. 26 and paragraph 0078).

18. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US Patent Application Publication No. 2004/0008989) in view of Kartalopoulos ("Introduction to DWDM Technology", IEEE Press, 2000; pages 161-167), and further in view of Mahon et al. ("Mahon") (US Patent No. 5477369) as applied to claims 32, 39-42, 44, 45 and 47-49 above, and further in view of Kowalski (US Patent Application Publication No. 2001/0048538).

Regarding claim 46, the combination of Hung, Kartalopoulos and Mahon discloses the method of Claim 39, but does not disclose that a frequency modulator is present in one path of each interferometer. Kowalkski discloses an interferometer-based transmitter, where a frequency shifter is used in one branch in order to achieve heterodyne signal detection (paragraphs 0049 and 0059). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a frequency shifter on the reference signal arm of the Hung coherence multiplexer, to achieve heterodyne signal detection for each coherence signal, since heterodyne signal detection is conventional for optical coherence transmission.

Conclusion

19. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pairdirect.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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